NATIONAL FIRE SPRINKLER ASSOCIATION, INC.
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Dr. Shyam Sunder
Deputy Director, Building and Fire Research Laboratory
National Institute of Standards and Technology
100 Bureau Drive
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Dear Dr. Sunder:

We appreciate the opportunity to provide comments based on our review of the draft "Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers." It is an impressive piece of work, and we congratulate your team on its efforts to date.

As a national organization dedicated to the concept of fire sprinkler protection of buildings, we are obviously most concerned with findings and recommendations relating to active fire protection systems. Within Section 8.4.1, the statement is made that the active fire protection systems were designed to meet then-current practice, and another statement is made that "Except for specific areas that were exempted from the required sprinkler coverage, sprinkler systems were installed throughout the towers." Someone referring to this section might get the false impression that fire sprinkler systems were included as part of the original design of the World Trade Center towers, and of course they were not. Although the technology was available at the time of construction, fire sprinkler systems were avoided, and only installed later on a retrofit basis. This information is currently found within footnote 44 on page 217 of the report and briefly on page 194, but deserves a more prominent position.

This issue is important to those who would question the amount of structural fire resistance provided within the building. Obviously, since automatic fire suppression systems were not contemplated as part of the original design, no reductions in fire resistance were provided in recognition of sprinklers.

With regard to recommendations, we support your Recommendation 12 that performance and redundancy of active fire protection systems be enhanced to accommodate buildings of greater risk, and enthusiastically support Recommendation 26 that state and local jurisdictions adopt and aggressively enforce available provisions in building codes to ensure that egress and sprinkler requirements are met by existing buildings.

We are obviously concerned that Recommendation 4 includes a review of the extent to which active fire protection should be permitted to substitute for passive fire protection. While we believe that a risk-based approach that considers potential failure modes of both active and passive systems is fair and appropriate, we are opposed to arbitrary assumptions that an active

system can be simply considered compromised or nonoperational for design purposes. Active fire suppression systems, more specifically automatic fire sprinkler systems, have a long history of proven ability and reliability. Any proposed limitation on recognizing the contribution of fire sprinkler systems to the separate objectives of occupant life safety, prevention of fire spread and structural integrity runs counter to your Recommendation 9 supporting the use of performance-based codes and Recommendation 28 to involve fire protection engineers as part of the design team for innovative or unusual fire safety systems.

As stated in Recommendation 28, however, we believe many of the recommendations should be focused on applying the lessons of the World Trade Center to buildings that similarly include innovative features or high-risk profiles. There is an old maxim that "hard cases make bad law", and we believe it would be a mistake to attempt to apply all of these recommendations to the broader building regulatory system.

As stated on page 199 of the report, NIST reportedly considered "Whether these findings relate to the unique circumstances surrounding the terrorist attacks of September 11, 2001, or to normal building and fire safety considerations." It appears that NIST concluded the situation was not unique, noting on the same page that "While there were unique aspects to the design of the WTC Towers and the terrorist attacks of September 11, 2001, the design, construction, operation, and maintenance of the WTC Towers...were based on procedures and practices that are commonly used for normal conditions."

At least with regard to automatic sprinkler protection, this is totally wrong. Going back to 8.4.1, the report notes that "all the fires that occurred in sprinklered spaces in the towers prior to September 11, 2001 were controlled with three or fewer sprinklers", and that "The sprinkler system could have provided fire control at coverage areas of up to two or three times the specified design area of 1500 ft^2." As demonstrated by experience, the specified 1500 ft^2 design area itself includes a safety factor relative to normal experience. Yet the report goes on to note that "the extent of the initial fires in WTC 1 and WTC 2 were considerably greater than three times these specified design areas." To consider this applicable to normal building and fire safety considerations means that the impact of fuel-laden jets is to become a design consideration for normal buildings.

We believe that NIST should revisit the question of which recommendations are really appropriate to normal building construction. To apply the lessons of the World Trade Center to all buildings may well increase construction costs without any appreciable increase in occupant life safety or prevention of fire spread beyond that available through current model building codes.

Very truly yours,

Russell P. Fleming, P.E.
Executive Vice President